KURT ANDRESEN

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Education

09/02 - 08/07 **Ph.D.** in *Applied Physics*, Cornell University , Ithaca, NY
Thesis Title: *Counterion Competition around DNA in Solution Measured with Anomalous Small-Angle X-Ray Scattering*
- Graduate Minor in Science Communication

09/98 - 05/02 **B.A.** in *Physics*, Boston University, Boston, MA
- Graduated *cum laude*
- Minor in Music

Professional Experience

09/20 - Present **Professor of Physics**
Gettysburg College, PA, 17325

05/19 - Present **Affiliate of Biochemistry and Molecular Biology**
Gettysburg College, PA, 17325

09/15 - 08/20 **Associate Professor of Physics**
Gettysburg College, PA, 17325

06/18 - 12/18 **Visiting Researcher**
Ulrich Keyser Group, Cambridge University, Cambridge, UK

06/13 - 12/13 **Visiting Researcher**
John van Noort Group, Leiden University, Leiden, NL

08/09 - 09/15 **Assistant Professor of Physics**
Gettysburg College, PA, 17325

08/08 - 05/09 **Visiting Assistant Professor of Physics and Astronomy**
Colgate University, Hamilton, NY

08/07 - 07/08 **Postdoctoral Teaching & Research Fellow**
Prof. Beth Parks Group, Colgate University, Hamilton, NY

09/02 - 08/07 **Research Assistant**
Prof. Lois Pollack Group, Cornell University, Ithaca, NY

06/00 - 08/02 **Undergraduate Research Assistant**
Prof. Ralph Colby Group, Penn State Univ., State College, PA

09/99 - 05/02 **Undergraduate Research Assistant**
Prof. Rama Bansil Group, Boston University, Boston, MA

Publications

- Journal Articles (*Student Authors **Boldface***)

1. W. Meng, R. Timsina, **A. Bull ('16)**, **K. Andresen***, X. Qiu*, *Additive Modulation of DNA-DNA Interactions by Interstitial Ions*, Biophysical Journal, **118**, 12 (2020)
   *Co-corresponding authors
2. A. Plumridge, **K. Andresen**, L. Pollack, *Visualizing disordered single-stranded RNA: connecting sequence, structure and electrostatics*, Journal of the American Chemical Society, **142**, 1, (2020)
3. J. Mc Hugh, **K. Andresen**, U. F. Keyser, *Cation dependent electroosmotic flow in glass nanopores*, Applied Physics Letters, **115**, 11, (2019) **(Editor's Pick)**
4. **C. M. Harris ('17)**, **S. Miller ('17)**, **K. Andresen**, L. B. Thompson, *Quantitative measurement of sodium polystyrene sulfonate adsorption onto CTAB capped gold nanoparticles reveals hard and soft coronas* , Journal of Colloid and Interface Science, **510**, 39, (2017)
5. L. B. Thompson, G. Carfagno, **K. Andresen**, **A. Sitton ('14)**, **T. Bury ('16)**, **L. L. Lee ('15)**, **K. T. Lerner ('17)**, P. P. Fong, *Differential uptake of gold nanoparticles by two species of tadpole, the wood frog (lithobates sylvaticus) and the bullfrog (l. Catesbeianus)*, Environmental Toxicology and Chemistry, **36**, 3351, (2017)
6. A. Plumridge, S. P. Meisburger, **K. Andresen**, L. Pollack, *The impact of base stacking on the conformations and electrostatics of single-stranded DNA* , Nucleic Acids Research, **45**, 3932, (2017)
7. H. Meng, **K. Andresen**, J. van Noort, *Quantitative analysis of single-molecule force spectroscopy on folded chromatin fibers*, Nucleic Acids Research, **43**, 3578, (2015)
8. **K. Andresen**, I. Jimenez-Useche, S. C. Howell, C. Yuan, X. Qiu, *Solution Scattering and FRET Studies on Nucleosomes Reveal DNA Unwrapping Effects of H3 and H4 Tail Removal*, PLoS One, **8**, e78587, (2013)
9. X. Qiu, **J. Giannini ('12)**, S. C. Howell, Q. Xia, F. Ke, **K. Andresen**, *Ion Competition in Condensed DNA Arrays in the Attractive Regime*, Biophysical Journal, **105**, 984, (2013)
10. S. C. Howell, **K. Andresen**, I. Jimenez-Useche, C. Yuan, and X. Qiu, *Elucidating Internucleosome Interactions and the Roles of Histone Tails*, Biophysical Journal, **105**, 194, (2013)
11. X. Qiu, **K. Andresen**, J. Lamb, L. W. Kwok, and L. Pollack, *Abrupt Transition from a Free, Repulsive to a Condensed, Attractive DNA Phase, Induced by Multivalent Polyamine Cations*, Physical Review Letters, **101**, 228101, (2008)
12. J. Lamb, L. W. Kwok, X. Qiu, **K. Andresen**, H. Y. Park and L. Pollack, *Reconstructing Three dimensional Shape envelopes from time resolved small angle x-ray scattering data*, J. Applied Crystallography, **41**, 1046, (2008)
13. **K. Andresen**, X. Qiu, S. A. Pabit, J. S. Lamb, H. Y. Park, L. W. Kwok, and L. Pollack, *Mono- and Tri-valent Ions around DNA: A Small-Angle Scattering Study of Competition and Interactions*, Biophysical Journal, **95**, 287, (2008)
14. J. C. Schlatterer, L. W. Kwok, J S. Lamb, H. Y. Park, **K. Andresen**, M. Brenowitz, and L. Pollack, *Hinge Stiffness Is a Barrier to RNA Folding*, Journal of Molecular Biology, **379**, 859, (2008)

15. X. Qiu, **K. Andresen**, L. W. Kwok, J. S. Lamb, H. Y. Park, and L. Pollack, *Inter-DNA Attraction Mediated by Divalent Counterions*, Physical Review Letters, **99**, 038104, (2007)
16. J. S. Lamb, S. Cornaby, **K. Andresen**, L. Kwok, H. Y. Park, X. Qiu, D. M. Smilges, D. H. Bilderback, and L. Pollack, *Focusing capillary optics for use in SAXS*, Journal of Applied Crystallography, **40**, 193, (2007)
17. X. Qiu, L. W. Kwok, H. Y. Park, J. S. Lamb, **K. Andresen**, and L. Pollack, *Measuring Inter-DNA Potentials in Solution*, Physical Review Letters, **96**, 138101, (2006)
18. L.W. Kwok, I. Shcherbakova, J.S. Lamb, H. Y. Park, **K. Andresen**, H. Smith, M. Brenowitz, and L. Pollack, *Concordant exploration of the kinetics of RNA folding from global and local perspectives*, Journal of Molecular Biology, **355**, 282, (2006)
19. **K. Andresen**, R. Das, H. Y. Park, *et al.*, *Spatial distribution of competing ions around DNA in solution*, Physical Review Letters, **93**, 248103, (2004)

- Encyclopedia Chapter
  - J. M. Morán-Mirabal, **K. Andresen**, J. D. Mcmullen, *History of Nobel Laureates in Physics*, in Fundamentals of Physics, [ed. J. L. Moran Lopez], in Encyclopedia of Life Support Systems (EOLSS), Developed under the Auspices of the UNESCO, EOLSS Publishers, Oxford, UK, [http://www.eolss.net], (2005)

Invited and Contributed Talks

1. *Electrostatics of Polyelectrolyte-Wrapped Gold Nanoparticles*, **K. Andresen**, Cambridge University, Cambridge, England. (November, 2018) (Invited)
2. *Quantitative Analysis of Single-Molecule Force Spectroscopy Data on Chromatin Fibers*, **K. Andresen**, H. Meng, J. van Noort, Biophysical Society Annual Meeting, San Francisco, CA. (February, 2014)
3. *Humanism and the Sciences: Finding a Balance*, **K. Andresen**, University of Maine, Orono, ME. (March, 2012) (Invited)
4. *DNA Packing: Determining the Role of Ions on the Self-Attraction of Polyelectrolytes*, **K. Andresen**, 2011 Biophysical Society Regional Meeting, Hershey, PA. (November, 2011) (Invited)
5. *DNA packing: The Physics of Strangely Attractive Molecules*, **K. Andresen**, Dickinson College, Carlisle, PA. (September, 2010) (Invited)
6. *DNA packing and the Nucleosome: How to fit 2m of DNA into 0.000001m.*, **K. Andresen**, Gettysburg College, Gettysburg, PA. (March, 2010) (Invited)
7. *DNA packing and the Nucleosome: How to fit 2m of DNA into 0.000001m.*, **K. Andresen**, Gettysburg College, Gettysburg, PA. (February, 2009) (Invited)
8. *DNA and the Nucleosome: The Physics of Strangely Attractive Biomolecules*, **K. Andresen**, Drew University, Madison, NJ. (February, 2009) (Invited)
9. *DNA and the Nucleosome: The Physics of Strangely Attractive Molecules*, **K. Andresen**, Mount Holyoke College, South Hadley, MA. (December, 2008) (Invited)

10. *DNA and the Nucleosome: The Physics of Strangely Attractive Particles*, **K. Andresen**, Ithaca College, Ithaca, NY. (October, 2008) (Invited)

11. *Electrostatics in Biology: Simple Equations, Complex Behavior*, **K. Andresen**, Clarion University of Pennsylvania, Clarion, PA. (May, 2008) (Invited)

12. *Electrostatics in Biology: Simple Equations, Complex Behavior*, **K. Andresen**, State University of New York, Potsdam, Potsdam, PA. (March, 2008) (Invited)

13. *Anomalous Small-Angle X-ray Scattering Study of Trivalent Mediated DNA-DNA Interactions through Ion Competition*, **K. Andresen**, S. A. Pabit, X. Qiu, J. S. Lamb, H. Y. Park, L. W. Kwok, L. Pollack, Biophysical Society Annual Meeting, Long Beach, CA. (February, 2008)

14. *Electrostatics in Biology: Simple Equations, Complex Behavior*, **K. Andresen**, Colgate University Physics and Astronomy Colloquium, Hamilton, NY. (May, 2007) (Invited)

15. *The Electrostatics of Biology*, **K. Andresen**, Wells College Physics Colloquium Series, Aurora, NY. (May, 2007) (Invited)

16. *Anomalous Small Angle X-Ray Scattering (ASAXS) Study of Multivalent Ion-DNA Interactions*, **K. Andresen**, J. S. Lamb, X. Qiu, L. Kwok, H. Y. Park, L. Pollack, APS Physics March Meeting, Denver, CO. (March, 2007)

17. *Anomalous Small Angle X-Ray Scattering (ASAXS) Study of Multivalent Ion-DNA Interactions*, **K. Andresen**, Cornell High Energy Synchrotron Source (CHESS) G-Line Symposium, Cornell University, Ithaca, NY. (January, 2007) (Invited)

18. *Ion Distributions Around DNA: Can Transitions Be Observed?*, **K. Andresen**, L. Kwok, X. Qiu, H. Y. Park, J. S. Lamb, L. Pollack, APS Physics March Meeting, Baltimore, MD. (March, 2006)

19. *Competition and Spatial Distribution of Ions Diffusively Bound to DNA*, **K. Andresen**, R. Das, H. Y. Park, *et al.*, APS Physics March Meeting, Los Angeles, CA. (March, 2005)

20. *Competition and Spatial Distribution of Ions Diffusively Bound to DNA*, **K. Andresen**, Cornell High Energy Synchrotron Source (CHESS) Journal Club Talk, Ithaca, NY. (February, 2005) (Invited)

Student Posters

1. *Electrostatics of Dna-Wrapped Cationically Stabilized Gold Nanospheres*, **S. Miller (*student*)**, **C. Harris (*student*)**, L. Thompson, **K. Andresen** BPS 61st Annual Meeting, New Orleans, LA. (February, 2017)

2. *Elucidating the Role of Electrostatics in Condensed DNA Arrays*, **S. Hansen (*student*)**, W. Meng, **A. Bull (*student*)**, X. Qiu, **K. Andresen** BPS 60th Annual Meeting, Los Angeles, CA. (February, 2016)

3. *Utilization of Novel Techniques to Measure Ion Compositino of Condensed Nucleosome Core Particles*, **A. Bull (*student*)**, **K. Andresen** BPS 60th Annual Meeting, Los Angeles, CA. (February, 2016)

4. *Electrostatic Effects of the Ion Atmosphere on Nucleosome Core Particle Interactions*, **L. Nowicki (*student*)**, **B. Flood (*student*)**, **K. Andresen** BPS 56th Annual Meeting, Philadelphia, PA. (February, 2013)

5. *Elucidating the Role of Ions in DNA Condensation: Measurements of the Ion Atmosphere Surrounding Condensed DNA Pellets Using Inductively-Coupled Plasma Atomic Emission Spectroscopy*, **J. Giannini (*student*)**, Q. Xia, X. Qiu, **K. Andresen** BPS 56th Annual Meeting, San Diego, CA. (February, 2012)

6. *Determination of the Ion Composition of Condensed DNA Utilizing Inductively-Coupled Plasma Atomic Emission Spectroscopy*, **J. Giannini (*student*)**, X. Qiu, **K. Andresen** BPS 55th Annual Meeting, Baltimore, MD. (March, 2011)

Grants

- Research

05/11	Principal Investigator, **Single-Investigator Cottrell College Science Award**, Research Corporation for Science Advancement, *$35,000 with $10,000 institutional match over two years*
04/11	Principal Investigator, **Research and Professional Development Grant**, Gettysburg College Faculty Development Committee, *$5,800 over two years*
04/12	Principal Investigator, **Research and Professional Development Grant**, Gettysburg College Faculty Development Committee, *$6,300 over two years*
01/13	Principal Investigator, **Research and Professional Development Grant**, Gettysburg College Faculty Development Committee, *$5,000 over two years*
04/14	Principal Investigator, **Research and Professional Development Grant**, Gettysburg College Faculty Development Committee, *$6,000 over two years*
12/15	Principal Investigator, **Research and Professional Development Grant**, Gettysburg College Faculty Development Committee, *$3,600 over two years*
08/17	Co-Principal Investigator, **National Science Foundation Major Research Instrumentation Award,** *$112,136*

- Teaching

09/15	**Academic Technology Fellow**, Gettysburg College Faculty Development Committee, *$2,000 stipend*

Service

- Professional Service

Present	Reviewer for Nature Communications, Scientific Reports, American Journal of Physics, Physics Teacher
Present	Reviewer for NSF
2014	Co-Chair of Session, Biophysical Society Annual Meeting
2018	Invited Panelist on Primarily Undergraduate Institutions Career Panel, Biophysical Society Meeting

- College Service

2010-2012	Honor Commission Member
2011-2012	HHMI Grant Writing Committee
2011-2012	Honor Code Review Committee
2012-2013	MCAT Advisory Group
2012-2016	HHMI Advisory Committee
2015-2018	Ad Hoc Member of Johnson Center for Creative Teaching and Learning
2016-Present	Qualified Administrator for Intercultural Development Inventory (IDI)
2016-Present	Inclusion Partner
2017-2018	Interim X-SIG Coordinator
2019-Present	Leadership Team, HHMI Grant Committee
2020-Present	Faculty Personnel Committee Member

- Department Service

2012-Present	Multiple Department Search Committees *(for a total of 10 hires)*
2011-Present	Department Media Czar
2014-2017	Department Assessment Coordinator
2019-Present	Department Diversity and Inclusion Liason